HEBE.

CAMBRIDGE. Northumberland Equatoreal. (Prof. Challis.)

1848.	Greenwich M.T. h m s	Apparent R.A. h m s	Log. $\frac{p}{P}$	Apparent N.P.D. ° ′ ″	Log. $\frac{q}{P}$	No. of Comps. R.A.	No. of Comps. N.P.D.	Star.
Aug. 22	14 9 22·2	5 12 45·17	−8·600	81 26 5·8	−9·877	1	1	*a*
	14 31 10·0	47·39	8·583	8·9	9·872	10	6	*b*
	15 18 0·7	50·62	8·542	5·1	9·862	2	2	*c*
24	13 31 51·4	16 18·79	8·614	81 30 9·9	9·885	7	6	*d*
Sept. 4	14 57 54·7	35 13·77	8·529	82 0 27·3	9·863	8	6	*e*
6	14 5 14·9	5 38 23·74	8·580	82 7 6·4	9·873	4	4	*e*
	14 17 16·1	25·15	−8·569	8·6	−9·871	2	2	*f*

No correction has been applied for parallax. (See note to *Metis*.) The following are the adopted mean places of the stars.

	Mean R.A. 1848·0 h m s	Mean N.P.D. 1848·0 ° ′ ″	Star.
a =	5 12 32·14	81 27 59·6	B.A.C. 1656
b =	5 13 27·09	81 43 35·2	Not in catalogues
c =	5 9 52·05	80 57 2·0	Bessel, v. 219
d =	5 16 24·09	81 38 29·8	— v. 375
e =	5 35 26·37	82 5 55·9	H.C. 10816
f =	5 39 40·35	82 5 56·6	Bessel, v. 1015

to 1·0:" *i. e.* the semi-axis major of the exterior planet to be 33·6 nearly. As a consequence of this change in the semi-axis major he also infers, "that the excentricity of the exterior planet would be very small," and it is evident that the mass would also be much diminished. In these respects Mr. Adams' theoretical elements make a notable approach to the elements of *Neptune*. He infers, too, "that the corresponding mean longitude, 1st October, 1846, would be about 315° 20′," which is wide of the truth, for as his mean distance assigns no sensible value to the excentricity, his mean and true heliocentric longitudes cannot differ widely, whence the error in the assigned place of the planet would be nearly 10° (See Mr. Adams' remarks, *Nautical Almanac*, 1851, Appendix, p. 291).

On looking over Mr. Adams' solution, we find that his first determination is of the *difference of mean longitude between Uranus and his disturbing planet in* 1810·328. On his first hypothesis of $\frac{a}{a'} = 0{\cdot}5$ he finds the longitude of the disturbing planet = 269° 25′, on his second hypothesis of $\frac{a}{a'} = 0{\cdot}515$ he finds the longitude of the disturbing planet = 264° 50′, whence it would follow (if simple proportion can be trusted in such a case) that for $\frac{a}{a'} = 0{\cdot}57$ the resulting mean longitude = 248° 1′ nearly, *i.e.* at 1810·328. Now this was, very nearly, the longitude of *Neptune* at that time, the error in 1846 being almost wholly due to the erroneous mean motion in bringing up the mean longitude to 1846.

It will be seen, on carefully considering the tables in *Nautical Almanac*, 1851, Appendix, pp. 289, 290, that the observations from 1712 to 1840 can be equally well satisfied on different hypotheses of the mean distance of the disturbing planet, and that, from the nature of the case, the changes in the perturbations resulting from a difference in the assumed mean distance are compensated by corresponding changes in the elements of *Uranus* and the disturbing planet. Within what limits this general statement is true must be left to competent inquirers.

These places were derived from the Catalogues, with the exception of those of *a* and *b*, which were determined by equatoreal comparisons with 14 *Orionis*, the place of the former star being given only approximately in the British Association Catalogue.

HAMBURG. Equatoreal. (M. Rümker.)

1848.	Hamburg M.T. h m s	R.A. ° ′ ″	Dec. ° ′ ″
Sept. 4	14 28 9·4	83 47 22·9	+7 59 51·4
5	14 36 55·9	84 11 19·4	56 29·9
6	13 58 33·7	35 20·7	52 55·3
7	14 23 11·7	84 59 25·5	49 26·2
9	13 58 53·3	85 46 6·6	42 5·8
12	14 35 57·4	86 55 8·0	30 11·6
14	13 8 23·0	87 38 0·5	22 31·1
15	15 46 48·8	88 0 47·0	7 17 34·1::
20	13 29 28·8	89 44 35·2	6 56 12·0
21	13 12 58·0	90 4 9·5	51 51·1
22	13 26 41·3	90 24 2·0	47 3·4
23	12 55 57·6	91 42 54·5	42 13·4
24	12 55 40·4	91 1 51·8	+6 37 51·9

IRIS.

CAMBRIDGE. Northumberland Equatoreal. (Prof. Challis.)

1848.	Green. M.T. h m s	Appt R.A. h m s	Log. $\frac{p}{P}$	Appt N.P.D. ° ′ ″	Log. $\frac{q}{P}$	No. of Comps.	Star.
Aug. 22	15 42 23·4	7 35 26·11	−8·641	69 21 57·1	−9·859	3	*a*
Sept. 2	15 3 50·9	7 59 22·51	8·637	70 43 1·5	9·874	4	*b*
6	14 52 9·0	8 7 45·71	8·635	71 15 8·9	9·877	3	*c*
	15 19 20·5	48·41	−8·635	17·3	−9·863	4	*d*

Parallax has not been applied. The stars and authorities for their places are the following,—

a = B.A.C. 2556 *b* = B.A.C. 2683 *c* = B.A.C. 2759 *d* = H.C. 16245

The results of comparison with Mr. Hind's Ephemeris (*Monthly Notice*, No. 8), after correcting for parallax and aberration, are as follows :—

	R.A. Obsd—Cald s	N.P.D. Obsd—Cald ″
August 22	− 7·92	−27·5
Sept. 2	8·68	39·2
6	10·15	44·8
	− 9·81	−45·6

HAMBURG. Equatoreal. (M. Rümker.)

1848.	Hamburg M.T. h m s	R.A. ° ′ ″	Dec. ° ′ ″
Sept. 23	14 34 54·2	130 22 23·8	+16 15 35·6